UNITED STATES ATOMIC ENERGY COMMISSION

UNIVERSITY
OF MICHIGAN
AUG 14 1956
ENGINEERING
LIBRARY

Nuclear Science Abstracts

Volume 10 No. 14
Abstracts 3961 - 4117
July 31, 1956

Technical Information Service Extension, Oak Ridge, Tenn.

LEGAL NOTICE

This report was prepared as an account of Government sponsored work. Neither the United States, nor the Commission, nor any person acting on behalf of the Commission:

A. Makes any warranty or representation, express or implied, with respect to the accuracy, completeness, or usefulness of the information contained in this report, or that the use of any information, apparatus, method, or process disclosed in this report may not infringe privately owned rights; or

B. Assumes any liabilities with respect to the use of, or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

As used in the above, "person acting on behalf of the Commission" includes any employee or contractor of the Commission to the extent that such employee or contractor prepares, handles or distributes, or provides access to, any information pursuant to his employment or contract with the Commission.

NUCLEAR SCIENCE ABSTRACTS

Volume 10 July 31, 1956 No. 14

GENERAL

ATOMIC POWER

3961 TID-5315(Vols.I and II)
International Conference on the Peaceful Uses of Atomic Energy, Geneva.
REPORT OF THE UNITED STATES DELEGATION TO THE INTERNATIONAL CONFERENCE ON THE PEACEFUL USES OF ATOMIC ENERGY HELD BY THE UNITED NATIONS, AUGUST 8-20, 1955, GENEVA, SWITZERLAND; WITH APPENDICES AND SELECTED DOCUMENTS. VOLUMES I AND II. [Norvell Page, comp. and ed.]. (Vol.I, 377p. and Vol.II, 573p.).

These two volumes were issued separately but are cataloged as a unit.

The background for the conference is given. Plenary sessions papers are abstracted but discussions are quoted. Lists are included of technical sessions, U. S. papers, organizations, delegates, exhibits with some pictures included, contents of the technical library, and films available. Press releases are reported. (F.S.)

3962 AEC-tr-2435(Pt. 3)
CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 194p.

The 18 papers collected in this book were originally translated from the Russian and appeared in Nuclear Science Abstracts Vol. 9 with the following abstract numbers: 7683, 7742, 7743, 7753, 7777, 7778, 7779, 7780, 7781, 7799, 7800, 7801, 7802, 7803, 7804, 7805, 7806, and 7861. (L.M.T.)

Refer also to abstracts 3965, 4001, and 4061.

BIOLOGY AND MEDICINE

3963 UCRL-3349
California. Univ., Berkeley. Radiation Lab.
BODY COMPOSITION FROM FLUID SPACES AND DENSITY: ANALYSIS OF METHODS. William E. Siri. Mar. 19, 1956. 33p. Contract W-7405-eng-48. $0.30(OTS).

The gross composition of the human body is regarded as a mixture of water, lipids, and fat-free solids, the last consisting mainly of protein and inorganic mineral. The proportions of these constituents are important biological variables, both in normal and diseased states of the body, but their evaluation has been subject to considerable uncertainty. Total body water is the only constituent amenable to direct measurement in vivo, whereas the remaining constituents can only be estimated indirectly from the proportion of body water or from the whole-body density. The indirect methods for estimating fat and fat-free solids are subject therefore to both experimental error and biological variability. The consequent uncertainty in the estimates depends largely on the assumptions that are inherent in the methods that are used. Each of the procedures for estimating body composition that is based on body water, corporal density, or a combination of these measurements is examined for its basic premises, its formulation, and the limits of its validity. Formulas are derived for calculating total depot fat in humans and for calculating the standard deviation. In general, the uncertainty in fat estimated from density or water is about ±4% of body weight, whereas combined body water and density yield an error of ±2%. (auth)

3964 UCRL-3350
California. Univ., Berkeley. Radiation Lab.
THE PROBLEM OF SYNTHETIC LETHALS IN DROSOPHILA MELANOGASTER. Philip E. Hildreth. Mar. 19, 1956. 23p. Contract W-7405-eng-48. $0.25(OTS).

3965 AEC-tr-2435(Pt. 4)
CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 198p.

The 21 papers of this translation were originally abstracted from the Russian and appear in Nuclear Science Abstracts Vol 9 with abstract numbers 7612, 7613, 7614, 7615, 7616, 7617, 7618, 7619, 7620, 7637, 7655, 7656, 7657, 7658, 7659, 7660, 7661, 7662, 7663, 7664, 7665. (L.M.T.)

3966 AEC-tr-2468
RESPIRATORY EXCHANGE OF ANIMAL LIVERS TREATED WITH ISONICOTINIC HYDRAZIDE INI. N. Canal and S. Garattini. Translated by Soliska R. Harris from Giorn. ital. chemioterapia 2, 63-70(1955). 15p.

RADIATION EFFECTS

3967 AECU-3186
Utah. Univ., Salt Lake City.
EFFECTS OF ULTRAVIOLET RADIATION ON CHLOROPLAST REACTIONS AND PLANT METABOLISM. Technical Report No. 16. Donald R. Anderson, John D. Spikes, and Berger C. Mayne. June 15, 1955. 40p. Project No. 4. Contract AT(11-1)-82. $7.80(ph OTS); $3.30(mf OTS).

3968 BNL-384
Brookhaven National Lab., Upton, N. Y.
TWELVE-MONTH POSTEXPOSURE SURVEY ON MARSHALLESE EXPOSED TO FALLOUT RADIATION. E. P. Cronkite, C. L. Dunham, David Griffin, S. D. McPherson, and Kent T. Woodward. Aug. 1955. 15p. $0.15(OTS).

The Marshallese who were accidentally exposed to fallout radiation were studied for a one-week period 12 months after exposure. Complete physical examinations were made. Special eye examinations with photographic recording of the lens were performed. In addition, blood counts and selected laboratory studies were accomplished. The skin of some show slight depigmentation and scarring at the site of previous beta burns. Eyes revealed no lesions attributable to radiation. The neutrophil counts were back to the normal range. The platelets and lymphocytes showed a further increase above the six-month level but still were below the values for the control population. (auth)

3969 UCLA-367
California. Univ., Los Angeles. Atomic Energy Project. THE EFFECT OF GAMMA IRRADIATION UPON THE RETINA OF BUFO. Bennet M. Allen and Marion Hubble Devick. May 1, 1956. 19p. Contract AT-04-1-GEN-12. $3.30(ph OTS); $2.40(mf OTS).

3970 AEC-tr-2435((Pt. 4) (p.15-20))
ACTION OF IONIZING RADIATIONS ON THE ANIMAL ORGANISM. L. A. Orbeli. p.15-20 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 6p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7612.

3971 AEC-tr-2435((Pt. 4) (p.21-32))
EFFECT OF IONIZING RADIATIONS ON THE FERTILITY OF MICE AND THE VIABILITY OF THEIR PROGENY. N. I. Nuzhdin, N. I. Shapiro, O. N. Petrova and O. N. Kitaeva. p.21-32 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7613.

3972 AEC-tr-2435((Pt. 4)(p.45-58))
LOCAL ACTION OF X-RAYS ON VARIOUS DIVISIONS OF THE CENTRAL NERVOUS SYSTEM OF ANIMALS. P. F. Minaev. p.45-58 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7614.

3973 AEC-tr-2435((Pt. 4)(p.59-68))
BIOCHEMICAL BASIS OF THE BIOLOGICAL ACTION OF IONIZING RADIATIONS. A. M. Kuzin. p.59-68 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7615.

3974 AEC-tr-2435((Pt. 4)(p.69-78))
ACTION OF IONIZING RADIATION ON SOLUTIONS OF PROTEINS AND PROTEIN COMPLEXES. A. G. Pasynsky [Pasynskii]. p.69-78 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7616.

3975 AEC-tr-2435((Pt. 4)(p.79-88))
CHARACTERISTICS OF THE INACTIVATION OF MICROORGANISMS IN RADIATION STERILIZATION. M. N. Meisel, T. S. Remezovz, R. D. Galtsova, G. A. Medvedeva, N. A. Pomoshchnikova, M. N. Shalnova, and V. M. Alekseeva. p.79-88 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7617.

3976 AEC-tr-2435((Pt. 4)(p.89-100))
THE EFFECT OF NUCLEAR RADIATIONS ON PLANTS. F. A. Vlasyuk. p.89-100 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7618.

3977 AEC-tr-2435((Pt. 4)(p.101-6))
EFFECT OF NATURAL RADIOACTIVE SUBSTANCES ON THE YIELD OF AGRICULTURAL CROPS. N. G. Zhezhel. p.101-6 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 6p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7619.

3978 AEC-tr-2435((Pt. 4)(p.107-12))
IONIZING RADIATIONS AS A STIMULANT OF ERGOSTEROL BIOSYNTHESIS. R. D. Galtsova. p.107-12 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 6p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7620.

RADIATION HAZARDS AND PROTECTION

3979 HW-42181
Hanford Atomic Products Operation, Richland, Wash. RADIOACTIVITY LEVELS OF THE COLUMBIA RIVER BELOW RICHLAND, WASHINGTON FOR THE PERIOD JULY, AUGUST, SEPTEMBER 1955. R. E. Rostenbach. Mar. 22, 1956. 9p. Contract W-31-109-Eng-52. $1.80 (ph OTS); $1.80(mf OTS).

Below Richland, Washington there is a gradual decrease in the concentration of β particle emitters in the Columbia River water. The concentration of α particle emitters in Columbia River water averages less than 5×10^{-9} μc/ml at all locations. The activity of α particle emitters in mud samples was less than the detection limit of 3×10^{-6} μc/gm; the average activity density of β particle emitters approximates those reported for the previous quarter. (auth)

3980 HW-42331
Hanford Atomic Products Operation, Richland, Wash. ADMINISTRATION OF NUCLEAR SAFETY AT HANFORD. R. L. Dickeman. Apr. 10, 1956. 12p. Contract W-31-109-Eng-52. $0.20(OTS).

Nuclear safety considerations arise in the Hanford Atomic Products Operation in the areas of fuel element fabrication, high power reactor design and operation, chemical processing plant operation, research reactor operations, and, on occasion, in critical experiments. The nuclear safety aspect of all production operations at Hanford is the joint responsibility of the Engineering and Manufacturing Departments. These responsibilities are clearly delegated within the respective departments to the appropriate levels in the line organizations. (F.S.)

3981 ORNL-2049
Oak Ridge National Lab., Tenn.
HEALTH PHYSICS DIVISION SEMIANNUAL PROGRESS

REPORT FOR PERIOD ENDING JANUARY 31, 1956. May 3, 1956. 68p. Contract W-7405-Eng-26. $10.80(ph OTS); $3.90(mf OTS).

Educational, training, and consultation activities engaged in during the period are reviewed. Publications during the period are listed. Data are presented from the following studies: the distribution and excretion of U in man; the influence of soil fertility on the uptake of Sr by plants; the effects of γ irradiation on vigor and fertility of the beetle, Onthopbagus texanus; the radiosensitivity of different species of arthropods; the uptake of fission products by earthworms; the separation of Cs^{137} from biological material; the spectrographic analysis of human tissues; investigations of waste-disposal pits for radioactive and chemical wastes; the disposal of radioactive waste material by fixation and fusing in an insoluble ceramic mass; factors affecting the ion-exchange removal or radioactive ions from contaminated water; the use of solvent extraction procedures for the separation of fission products from waste solutions; factors affecting the uptake of fission products by various soil types and clay storage-pit linears; the evolution of K^{42} from hot and boiling solutions; the efficiency of sand filters and lead shot columns in the removal of aerosols of various particle size; and developmental studies on design and improvement of radiation dosimeters. (For preceding period see ORNL-1942.) (C.H.)

3982 AEC-tr-2435((Pt. 4) (p.33-44))
INVESTIGATIONS OF THE PROTECTION OF THE ANIMAL ORGANISM AGAINST THE HARMFUL ACTION OF IONIZING RADIATIONS. E. Ya. Graevsky [Graevskii]. p.33-44 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7637.

3983 AEC-tr-2464
EXPERIMENTAL BASES FOR THE THERAPY OF POISONING WITH RADIOACTIVE SUBSTANCES. Alexander Catsch. Translated from Strahlentherapie 99, 290-300(1956). 21p.

TRACER APPLICATIONS

3984 AECU-3187
Arkansas. Univ., Little Rock. School of Medicine.
INTERMEDIARY METABOLISM OF THE PHOTOSYNTHETIC BACTERIA. Final Report. Nov. 1, 1955. 46p. Contract AT-(40-1)-1077. $7.80(ph OTS); $3.30(mf OTS).

3985 UCRL-3331
California. Univ., Berkeley. Radiation Lab.
THE PHOTOSYNTHETIC CYCLE AND RESPIRATION; LIGHT-DARK TRANSIENTS. James A. Bassham, Kakuo Shibata, Kjell Steenberg, Jean Bourdon, and M. Calvin. Mar. 1, 1956. 16p. Contract W-7405-eng-48. $0.20(OTS).

3986 AEC-tr-2435((Pt. 4) (p.1-14))
ACHIEVEMENTS AND PROSPECTS OF THE USE OF RADIOACTIVE ISOTOPES IN BIOCHEMISTRY. V. A. Englegardt. p.1-14 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7655.

3987 AEC-tr-2435((Pt. 4)(p.113-20))
USE OF C^{14} AND P^{32} IN THE STUDY OF THE SYNTHETIC FUNCTIONS OF ISOLATED CHLOROPLASTS. N. M. Sisakvan. p.113-20 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7656.

3988 AEC-tr-2435((Pt. 4)(p.121-6))
THE USE OF C^{14} FOR STUDYING THE PRIMARY PRODUCTS OF PHOTOSYNTHESIS. E. A. Boichenko and N. I. Zakharova. p.121-6 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 6p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7657.

3989 AEC-tr-2435((Pt. 4)(p.127-38))
DISTRIBUTION OF CARBON AMONG THE ORGANIC SUBSTANCES FORMED BY PHOTOSYNTHESIS. O. V. Zalensky [Zalenskii]. p.127-38 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7658.

3990 AEC-tr-2435((Pt. 4) (p.139-44))
USE OF RADIOACTIVE ISOTOPES IN STUDIES OF PLANT FERTILIZATION. I. M. Polyakov. p.139-44 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 6p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7659.

3991 AEC-tr-2435((Pt. 4) p.145-54))
STUDY OF THE NITROGEN NUTRITION AND METABOLISM OF PLANTS WITH THE USE OF THE N^{15} ISOTOPE. F. V. Turchin, M. A. Guminskaya, and E. G. Plyshevskaya. p. 145-54 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7660.

3992 AEC-tr-2435((Pt. 4) (p.155-62))
THE USE OF C^{14} IN STUDIES OF THE PHYSIOLOGY OF OIL-STORING PLANT FRUITS. V. E. Pontovich, p.155-62 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7661.

3993 AEC-tr-2435((Pt. 4) (p.163-72))
C^{14} IN THE STUDY OF THE METABOLIC RATE IN YEAST AND LACTIC ACID BACTERIA. I. Ya. Veselov, V. M. Levacheva, and E. G. Frolova. p.163-72 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955.

SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7662.

3994 AEC-tr-2435((Pt. 4) (p.173-80))
STUDY OF THE BIOCHEMICAL BASIS OF NERVE EXCITATION AND INHIBITION PROCESSES WITH THE AID OF ISOTOPES. Kh. S. Koshtoyants, T. M. Turpaev, and D. E. Ryvkina. p.173-80 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7663.

3995 AEC-tr-2435((Pt. 4) (p.181-8))
STUDY OF CARBOHYDRATE METABOLISM IN THE ANIMAL ORGANISM WITH THE AID OF RADIOACTIVE CARBON. B. N. Stepanenko. p.181-8 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7664.

3996 AEC-tr-2435((Pt. 4) (p.189-97))
THE MECHANISM OF CAROTENOID ACTION. CAROTENOIDS AND SULFUR METABOLISM. S. D. Balakhovsky [Balakhovskii] and I. V. Kuznetsova. p.189-97 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF BIOLOGICAL SCIENCE. (Translation). 9p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7665.

WASTE DISPOSAL

3997 UCLA-368
California. Univ., Los Angeles. Atomic Energy Project.
REDUCTION OF COMBUSTIBLE, LOW-LEVEL CONTAMINATED WASTES BY INCINERATION. Louis B. Silverman and Richard K. Dickey. May 15, 1956. 20p. Contract AT-04-1-GEN-12. $3.30(ph OTS); $2.40(mf OTS).

This report discusses the waste disposal problems of a project doing biological and medical research with radioactive isotopes. An incineration method is described for the reduction of combustible wastes contaminated with low-level amounts of radioisotopes and the results of using this method over a period of two years are reported. (auth)

CHEMISTRY

3998 LA-1972UNM
New Mexico. Univ., Albuquerque.
THE EXCHANGE REACTION BETWEEN SUBSTITUTED BENZYL IODIDES AND POTASSIUM IODIDE. V. p-CHLOROBENZYL IODIDE. Milton Kahn and J. L. Riebsomer. Nov. 1955. 8p. For Los Alamos Scientific Lab. Subcontract under [W-7405-eng-36]. $1.80(ph OTS); $1.80(mf OTS).

A measurable exchange has been observed in CH_3OH and C_2H_5OH between the iodine atom in p-chlorobenzyl iodide and I^- in KI. The exchange reaction was investigated over a temperature range from 0 to 30.9°C. The total I^- concentration in CH_3OH and in C_2H_5OH ranged from 0.00175 to 0.0117M and 0.00143 to 0.00991M, respectively. The rate laws for the exchange reaction are $R = 2.31 \times 10^{11} e^{-15,600/RT}$ (p-ClBzI) (KI) in CH_3OH, and $R = 4.69 \times 10^{12} e^{-16,740/RT}$ (p-ClBzI) (KI) in C_2H_5OH, where the units of R are mol/l/min. (auth)

3999 NBL-127
New Brunswick Lab., AEC, N. J.
SEMIANNUAL PROGRESS REPORT FOR THE PERIOD JULY 1955 THROUGH DECEMBER 1955. C. J. Rodden. May 1956. 26p. $0.25(OTS).

The applicability of p-dimethylaminoazophenylarsonic acid to the colorimetric determination of Zr in Th–Zr alloys containing from 0.05 to 2% Zr was studied. Dibenzoylmethane was found to be a selective reagent for the determination of U in a large variety of materials. Spectrographic gallium oxide standards and γ-absorption samples for Ra analysis were prepared. Studies were continued on an isotopic analysis of U and γ measurements, and the continuous polarographic determination of U in process streams. The V distribution between 25% TBP and 5N HNO_3 for the range 0.34 to 5.5 g/l vanadium was found to be 0.00037 ± 0.00005. Comparative data of nitric acid insolubles and the uranium content from U feed materials are tabulated. The reactivity of production-grade UO_3 was investigated. (For preceding period see NBL-117.) (C.W.H.)

4000 UCRL-3338
California. Univ., Berkeley. Radiation Lab.
THIOTIC ACID: PHYSICS, CHEMISTRY, AND BIOLOGY. Melvin Calvin. Apr. 2, 1956. 30p. Contract W-7405-eng-48. $0.25(OTS).

The relationships between the photosynthetic and tricarboxylic acid cycles, regarding thioctic acid as an intermediate, are discussed. Several chemical and physical properties of thioctic acid are reviewed. (C.W.H.)

4001 AEC-tr-2435(Pt. 2)
CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 215p.

The 19 papers collected in this book were originally translated from Russian and appeared in Nuclear Science Abstracts Vol. 9 with the following abstract numbers: 7681, 7682, 7704, 7713, 7714, 7718, 7719, 7720, 7725, 7776, 7796, 7935, 7936, 7937, 7938, 7939, 7940, 7941, and 7982. (L.M.T.)

4002 AEC-tr-2435((Pt. 2) (p. 153–62))
MOBILITY OF SULFUR–CARBON BONDS, AND THE MECHANISM OF THE ACTION OF RUBBER-VULCANIZATION ACCELERATORS. G. P. Miklukhin. p. 153–62 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7681.

4003 AEC-tr-2435((Pt. 2) (p. 163–76))
SULFUR EXCHANGE IN POLYSULFIDES AND IN VARIOUS VULCANIZATION ACCELERATORS. E. N. Guryanova,

V. N. Vasilyeva [Vasil'eva], and L. S. Kuzina. p. 163–76 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7682.

4004 AEC-tr-2435((Pt. 3) (p. 27–38))
KINETICS OF THE TRANSFER OF SULFUR FROM PIG IRON TO SLAG OF THE $CaO-Al_2O_3$ TYPE. O. V. Travin and L. A. Schvartsman [Shvartsman]. p. 27–38 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7683.

4005 AEC-tr-2463
INVESTIGATION OF COMPLEX FORMATION IN SOLUTIONS BY THE METHOD OF PROTON RESONANCE. A. I. Rivkind. Translated from Doklady Akad. Nauk S.S.S.R. 100, 933-6(1955). 9p.

The effective magnetic moment μ^2eff was shown to decrease as the size of the coordinated particles increased. Information on complex structure may be obtained from an estimation of this "screening" effect. (C.W.H.)

4006 AEC-tr-2465
HYDROGEN OVERVOLTAGE ON AMALGAMS. G. I. Volkov. Translated from Zhur. Fiz. Khim. 29, 390-1 (1955). 8p.

An estimation of the hydrogen over-voltage on liquid homogeneous amalgams based on the change in surface tension is proposed. (auth)

4007 AEC-tr-2467
FERROELECTRIC PROPERTIES OF SOLID SOLUTIONS IN THE BARIUM TITANATE–STRONTIUM TITANATE SYSTEM. G. A. Smolenskiy and K. I. Rozachev. Translated from Zhur. Tekh. Fiz. 24, 1751-60(1954). 19p.

4008 AEC-tr-2475
THE REVERSIBLE GLASS–TIN–SODIUM REFERENCE ELECTRODE IN FUSED SALTS. Yu. K. Delimarskii and A. A. Kolotti. Translated from Ukrain. Khim. Zhur. 16, 438-46(1950). 14p.

The conditions for the construction of a reversible glass–Sn–Na reference electrode for fused salts were investigated; a good reproducibility of the electrode was demonstrated. It was shown that the electrode potential of Ag became more negative during the transition from fused chlorides to fused iodides. (auth)

AEROSOLS

4009 HW-39129
[Hanford Atomic Products Operation, Richland, Wash.]
ELECTRICAL PRECIPITATOR FOR AEROSOL COLLECTION ON ELECTRON MICROSCOPE SCREENS. J. W. Baum. Sept. 22, 1955. 8p. Contract [W-31-109-Eng-52]. $1.80(ph OTS); $1.80(mf OTS).

An electrical precipitator was designed for the direct collection on electron microscope screens of atmospheric aerosol particles from atmospheres having very sparse dispersions of particles. (C.H.)

ANALYTICAL PROCEDURES

4010 A-2912(Vol.I)
Madison Square Area, Manhattan District, New York.
MANUAL OF ANALYTICAL METHODS. VOLUME I. ANALYSIS OF ORES. Lewis G. Bassett, Daniel J. Pflaum, Robert J. Rutman, Clement J. Rodden, and N. H. Furman. Jan. 1946. Decl. Sept. 23, 1955. 180p. $1.00(OTS).

A manual of chemical procedures for the determination of U_3O_8, Ra, and ThO_2 in ores is presented. NBS and Princeton University procedures for the complete analysis of ores, and Vanadium Corp. Research Lab. methods for determination of V_2O_5 in ores and minerals are outlined. (J.E.D.)

4011 A-2912(Vol. III)
Madison Square Area, Manhattan District, New York.
MANUAL OF ANALYTICAL METHODS. VOLUME III. ANALYSIS OF PURIFIED MATERIALS. Lewis G. Bassett, Daniel J. Pflaum, Robert J. Rutman, Clement J. Rodden, and N. H. Furman, comps. Jan. 1946. Decl. Sept. 22, 1955. 358p. $1.75(OTS).

A manual devoted to the analysis of purified uranium products and of several of the reagent materials used in their manufacture as presented. The excellent status of these methods, which provide a rounded picture of the problems of quality control attest to the success of the project laboratories in meeting the requirements of large-scale pure material manufacture. The assay and general analysis of purified U products, analysis of Mg, lime, and dolomite, determination of U density, shotgun extraction, and electrolytic-polarographic and spectrographic analysis are the main headings covered in the manual. (J.E.D.)

4012 DP-146
Du Pont de Nemours (E. I.) & Co. Savannah River Lab., Augusta, Ga.
DETERMINATION OF PLUTONIUM IN URINE. S. Marshall Sanders, Jr. Mar. 1956. 12p. Contract AT(07-2)-1. $0.15(OTS).

A description is given of a procedure for the determination of Pu in urine. The procedure includes two bismuth phosphate coprecipitations, two lanthanum fluoride coprecipitations, a thenoyltrifluoroacetone (TTA) solvent extraction, an electrodeposition, and a radioautographic determination. An average Pu recovery of 77% with a standard deviation of ±17% was obtained from 272 samples spiked with Pu to give 1.08 disintegrations per min. (auth)

4013 IDO-14316
Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho.
MANUAL OF THE ANALYTICAL METHODS USED BY THE CONTROL LABORATORY AT THE CHEMICAL PROCESSING PLANT. PARTS I AND II. M. J. Shepherd, Jr. and J. E. Rein, eds. Jan. 31, 1955. (Pt. I changed from OFFICIAL USE ONLY Apr. 28, 1955; Pt. II Decl. May 26, 1955). 382p. Contract AT(10-1)-205. $1.75(OTS).

These two parts were originally issued separately as IDO-14316 and IDO-14317, respectively.

Colorimetric methods are presented for determining U, Cl_2, Fe, PO_4^{3-}, Al^{3+}, Hg, and NO_3^-. Titrimetric methods are presented for acetate ions, H^+, Cl^-, dissolved CO_2, dissolved O_2, Al^{3+}, Ba^{2+}, Cr, Cr^{6+}, Cr^{3+}, Fe^{2+}, Hg^{2+}, NH_3, OH^-, ferrous sulfamate, and hexone. An absorption method is presented for determining NO, N_2O, NO_2, O_2, CO, CO_2,

and H_2. Uranium was also determined fluorophotometrically. Miscellaneous procedures included specific gravity determination, absolute beta counting, and solid-impurity determination. Thirty-nine procedures are presented. (C.W.H.)

4014 NAA-SR-1446

Atomics International Div., North American Aviation, Inc., Canoga Park, Calif.

SPECTROPHOTOMETRIC DETERMINATION OF ZIRCONIUM IN THORIUM. Louis Silverman and Dorothy W. Hawley. May 15, 1956. 16p. Contract AT-11-1-GEN-8. $3.30(ph OTS); $2.40(mf OTS).

The colorimetric determination of zirconium using sodium alizarin sulfonate as reagent has been adapted to tolerate at least 200 mg of thorium. The acidity should be controlled to that of a 40-ml solution having a pH of 0.70 plus 10 ml of (2:3) hydrochloric acid. Acetone and heat are used to develop and stabilize the color. The thorium content of the final samples should be 200 ± 10 mg per 50 ml of final solution corresponding to the content of the solutions used for the standard curve. The reproducibility of the determination of zirconium (0.01 to 0.70 mg) in thorium (200 mg) is in the range of 0.01% zirconium and the standard deviation is 0.002%. Higher percentages of zirconium may be determined with suitable sample and volume adjustment if the acid concentration is kept constant. (auth)

4015 NAA-SR-1488

Atomics International Div., North American Aviation, Inc., Canoga Park, Calif.

A RAPID AND PRECISE METHOD FOR THE DETERMINATION OF OXYGEN IN CERTAIN GASES: MODIFIED BRADY METHOD. Louis Silverman and Wanda Bradshaw. May 15, 1956. 30p. Contract AT-11-1-GEN-8. $0.25 (OTS).

Oxygen concentrations, as low as 0.01 ppm, are determinable in purified helium, hydrogen, or nitrogen. The working range is 0.01 to 15 ppm of oxygen and the precision varies from ±0.004 ppm at the lower values to ±0.2 ppm at the higher values. The Brady apparatus has been improved in pumping action and photometric response and a double set of graphs is used to obtain the final results. Sampling time is 1.5 hr for the very low oxygen concentrations and about one-half hr for the higher oxygen concentrations. (auth)

4016 RFP-56

Dow Chemical Co. Rocky Flats Plant, Denver.

MICROSCOPIC QUALITATIVE ANALYSIS USING CUPFERRON. W. S. Turnley. Jan. 1955. 12p. Contract AT(29-1)-1106. $0.15(OTS).

Cupferron can be used for the detection of Ba, Cd, Ca, Cu, Fe^{3+}, and U^{6+} in single component neutral solutions. Uranium(VI) can be detected in presence of excess Ba, La, Pb, Mg, Ag, or Zn; it cannot be detected in the presence of Al, Cd, Ca, Co, Cu, Fe^{3+}, Mn, or Ni, unless these cations have concentrations less than that of U^{6+} (auth)

4017 UCRL-3310

California. Univ., Berkeley. Radiation Lab.

THE MICRODETERMINATION OF METHYL GROUPS ATTACHED AT CARBON. Vazken H. Tashinian, Mary Jane Baker, and Charles W. Koch. Feb. 16, 1956. 31p. Contract W-7405-eng-48. $0.25(OTS).

Samples to be analyzed for methyl groups attached to carbon were digested with the $Na_2Cr_2O_7-H_2SO_4$ mixture in sealed tubes, which were heated in a rocking furnace. A jacketed distillation apparatus was used to aid in distilling the acetic acid produced from the reaction mixture. The distillation apparatus eliminated carry-over of H_2SO_4 spray and reduced the time required for distillation when the jacketing substance boiled at a temperature approximating the boiling point of $HC_2H_3O_2$. Diagrams of the apparatus used are included. Typical data are listed to show that $HC_2H_3O_2$ is produced quantitatively from several low-boiling aliphatic compounds. Data are also included to show that $HC_2H_3O_2$ is not obtained quantitatively from low-molecular-weight aliphatic amines. Three relatively complex compounds were investigated, by employing the Kuhn-Roth oxidation mixture and the increased amount of H_2SO_4 proposed by Ginger. The results do not show one reaction mixture to be clearly superior. However, they do suggest that prolonged digestion with the lesser amount of H_2SO_4 is more likely to produce the optimum amount of $HC_2H_3O_2$. (auth)

4018 AEC-tr-2435((Pt. 2) (p. 177–86))

ORGANIC COPRECIPITANTS IN ANALYTICAL CHEMISTRY. V. I. Kuznetsov. p. 177–86 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7704.

GRAPHITE

Refer to abstract 4113.

MOLECULAR STRUCTURE

4019 AEC-tr-2435((Pt. 2) (p. 129–44))

INVESTIGATION OF THE STRUCTURES AND REACTIVITIES OF COMPOUNDS WITH THE AID OF ISOTOPES. A. I. Brodsky [Brodskii]. p. 129–44 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 16p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7713.

4020 AEC-tr-2435((Pt. 2) (p. 145–52))

INVESTIGATION OF THE STRUCTURE AND REACTIONS OF COMPLEX COMPOUNDS BY THE METHOD OF LABELED ATOMS. A. A. Grimberg. p. 145–52 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7714.

RADIATION CHEMISTRY

4021 AEC-tr-2435((Pt. 2) (p. 23–32))

ACTION OF IONIZING RADIATIONS ON AQUEOUS SOLUTIONS OF INORGANIC SALTS. N. A. Bakh. p. 23–32 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7718.

4022 AEC-tr-2435((Pt. 2) (p. 33–44))
SENSITIZATION AND SUPPRESSION OF OXIDATION-REDUCTION REACTIONS OCCURRING DURING RADIOLYSIS. M. A. Proskurnin, V. D. Orekhov, and E. V. Barelko. p. 33–44 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7719.

4023 AEC-tr-2435((Pt. 2) (P. 45–54))
REGULARITIES OBSERVED IN THE MECHANISM AND KINETICS OF SIMPLE RADIATION-INDUCED REACTIONS. (FORMATION OF OZONE AND OXIDATION OF NITROGEN). S. Ya. Pshezhetsky [Pshezhetskii]. P. 45–54 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7720.

RADIATION EFFECTS

4024 AEC-tr-2435((Pt. 2) (p. 13–22))
ACTION OF NUCLEAR RADIATIONS ON HIGH POLYMERS. V. L. Karpov. p. 13–22 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7725.

SEPARATION PROCEDURES

4025 DOW-143
Dow Chemical Co. Western Div., Pittsburg, Calif.
PROGRESS REPORT [FOR] MARCH–APRIL 1956. Research Dept. R. H. Bailes. May 1, 1956. 35p. Contract AT-30-1-GEN-236. $4.80(ph OTS); $2.70(mf OTS).

Studies of the recovery of high-grade uranium products by new methods from various process streams, and of the application of solvent extraction processes to leach slurries of Colorado plateau ores and leach solutions of Florida leached zone material are described. (auth)

4026 AEC-tr-2470
ADSORPTION EXPERIMENTS WITH HEAVY NOBLE GASES. Kurt Peters and Kurt Weil. Translated from Z. physik. Chem. 148(A), 1-26(1930). 35p.

A method for the quantitative separation of argon, krypton, and xenon based on the adsorption on activated carbon is reported. Adsorption phenomena are discussed in the light of several adsorption isotherms obtained in the course of this investigation. (auth)

TRANSURANIC ELEMENTS AND COMPOUNDS

Refer to abstracts 4012 and 4051.

URANIUM AND URANIUM COMPOUNDS

4027 AECD-3687
Westinghouse Electric Corp. Lamp Div., Bloomfield, N. J.
THE ELECTROLYTIC PROCESS FOR THE MANUFACTURE OF URANIUM. J. W. Marden, W. C. Lilliendahl, G. Meister, R. Nagy, D. M. Wroughton, and N. C. Beese. June 24, 1946. Decl. June 29, 1955. 204p. $1.00(OTS).

An attempt was made to report all of the experimental work on the electrolytic process for U production in the following series of detailed and inter-related papers. The electrolytic process prior to 1942, photosynthesis of KUF_5, preparation of di-potassium uranous fluoride, design of electrolytic cell and electrode, salt bath composition, salts for electrolysis, electrolysis of various U oxides, operation of electrolytic cells, processing of electrode deposits, efficiency of the electrolytic method, fused U metal and its properties, fusion and casting of metal under salt, recovery of U-bearing sludges, and chemical purity of U. (J.E.D.)

ENGINEERING

4028 WAPD-153
Westinghouse Electric Corp. Bettis Plant, Pittsburgh.
EFFECT OF IRRADIATION ON WELDABILITY OF ASTM A212, GRADE B. Wendell R. Hutchinson. Feb. 15, 1956. 32p. Contract AT-11-1-GEN-14. $0.25(OTS).

In an endeavor to ferret out difficulties that might be encountered during the rewelding pressure vessels, weldability tests were conducted on ASTM A212, Grade B pressure plate material in both the irradiated and unirradiated conditions. An integrated thermal neutron flux in excess of that anticipated at the time of rewelding the pressure vessel was chosen for this investigation. No difficulties were observed during the welding of the test plates nor were any harmful effects noted during subsequent testing to indicate an irradiation-weldability relationship. The only factor observed which might influence the quality of a weld made on irradiated A212 material was the encumbrance of the welder with additional clothing and safety procedures and the resultant psycological effects on the quality of his work. (auth)

4029 AEC-tr-2435((Pt. 3) (p. 71–84))
INVESTIGATION OF THE ANTI-WEAR PROPERTIES OF OILS AND FUELS WITH THE AID OF RADIOACTIVE ISOTOPES. Yu. S. Zaslavsky [Zaslavskii]. p. 71–84 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7742.

4030 AEC-tr-2476
LIQUID CYCLONE AS A HYDRAULIC CLASSIFIER. Naoya Yoshioka and Yutaka Hotta. Translated from Chem. Eng. Japan 19, 632-40(1955). 20p

The classifying characteristics, capacity, required power, and the sensitivity of classification, and 50% point of the hydraulic cyclone for the treatment of relatively dilute suspensions were discussed. The hydraulic cyclone is an excellent apparatus for the classification of small particles whose size is less than 50 to 60μ; it is more economical to use small cyclones in series for the same degree of classification. (auth)

HEAT TRANSFER AND FLUID FLOW

4031 CF-56-1-31
Oak Ridge National Lab., Tenn.
TEST TO DETERMINE VELOCITY OF LEAKAGE ACROSS THE PASS PARTITION OF THE HRT HEAT EXCHANGER. P. P. Holz. Jan. 5, 1956. 9p. Contract [W-7405-eng-26]. $1.80(ph OTS); $1.80(mf OTS).

Test runs made at different gap spacings of the tongue and groove joint show steadying velocity begins to take place at 0.006-in. gap, in openings of less than 0.006 in. a transition of laminar to turbulent flow exists. Little corrosion formation takes place below 0.006 in. (F.S.)

MATERIALS TESTING

4032 AEC-tr-2471
METHOD OF DETERMINING THE STRESSES IN A CIRCULAR CYLINDER. M. Mesnager. Translated by K. Bevis from Compt. rend. 169, 1391-3(1919). 3p.

Stresses directed along the radius or perpendicular to the meridian planes are considered along with stresses parallel to the cylindrical axis in calculating internal stresses developed in a cylinder by annealing. (F.S.)

PUMPS

4033 CF-56-2-33
Oak Ridge National Lab., Tenn.
IMPROVEMENTS IN THE OPERATION OF WESTINGHOUSE 200A SLURRY PUMP. W. O. Hullings and A. S. Kitzes. Feb. 3, 1956. 7p. Contract [W-7405-eng-26]. $1.80(ph OTS); $1.80(mf OTS).

The basic difficulties encountered in the operation of the 200A slurry pump at 300°C and 2000 psi due to the failure to effect a good seal of the pump flanges, leakage around the thermal barrier, and failure of bearings are discussed. (auth)

TRACER APPLICATIONS

4034 AEC-tr-2435((Pt. 3) (p. 119–28))
INVESTIGATION OF THE CARRYOVER OF SALTS IN STEAM AND OF THE HYDRODYNAMICS OF THE STEAM–WATER MIXTURE BY MEANS OF RADIOACTIVE ISOTOPES. M. A. Styrikovich. p. 119–28 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7743.

MINERALOGY, METALLURGY, AND CERAMICS

CERAMICS AND REFRACTORIES

4035 UCRL-3352
California. Univ., Berkeley. Radiation Lab.
HEATS OF FORMATION OF REFRACTORY SILICIDES. Leo Brewer and Oscar Krikorian. Mar. 1956. 10p. Contract W-7405-eng-48. $0.15(OTS).

4036 AEC-tr-2435(Pt. 3) (p. 1–16))
THE ROLE OF THE REFRACTORY LININGS OF STEEL-POURING EQUIPMENT IN THE CONTAMINATION OF STEEL BY NON-METALLIC INCLUSIONS. E. S. Kalinnik and A. M. Samarin. p. 1–16 of the CONFERENCE OF ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 16p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7753.

GEOLOGY AND MINERALOGY

4037 AECU-3188
Division of Raw Materials, AEC.
SEARCH FOR URANIUM IN THE PHILIPPINES. Report of Investigation No. 12. H. E. Puttuck and H. S. Stafford. 1955. 20p.

A joint survey by the Philippine Bureau of Mines and the USAEC.

A joint program of preliminary reconnaissance for uranium in the Philippine Islands was arranged and carried out by the Philippine Bureau of Mines and the United States Atomic Energy Commission. There is a possibility that commercial quantities of uranium are present in the Philippines, but considerably more geologic study will be required before any definite conclusions can be drawn or the potential of any specific area determined. On the basis of the present reconnaissance, deposits which are most interesting include those at Baguio, the Paracale-Mambulao stock, the Masbate gold district, the Jotafe copper deposit, the eastern cordillera of Mindanao, and possibly the Pan-Philippine Mine at Lobo, Batangas. Deposits of moderate interest include the Looc lead-silver mine in Batangas and the Minerals Resources Mining Company deposit and the Pauli prospect (not visited), both of Marinduque. On the basis of present knowledge, areas of ultrabasic rocks, such as in the Zambales range, and probably also high temperature replacement deposits, are of least interest as possible sources of uranium. Reconnaissance in areas of acidic igneous rocks and detailed mineralogic studies of mineralized outcrops, prospects, and the ores of operating mines in such regions, is recommended to determine the possibilities of ore zoning and its relationship to radioactivity. Because of the difficulties of ground travel in many areas the possibility of airborne radioactivity surveying might be investigated. Further development of analytical procedures and additional facilities for assaying for uranium might also be considered. (auth)

4038 NYO-6069
Pennsylvania State Univ., University Park. Mineral Industries Experiment Station.
A MINERALOGICAL, PETROGRAPHIC AND PALEOBOTANICAL INVESTIGATION OF URANIFEROUS LIGNITES. SCOPE B—LIGNITES. Annual Progress Report [for] period of April 1, 1954 to March 31, 1955. E. F. Koppe, E. S. Erickson, Jr., C. L. Trotter, R. S. Good, A. R. Cameron, W. Spackman, Jr., and T. F. Bates. 112p. Project E-32. Contract AT(30-1)-1202. $18.30(ph OTS); $6.00(mf OTS).

The investigations described concern certain of the lignitic sediments in the Slim Buttes area of Harding Co, S. Dakota. The field and laboratory studies have been directed toward attaining: an understanding of the mode of occur-

rence of uranium concentrations with regard to associated organic and inorganic constituents; an understanding of the effect of normal weathering upon the composition of the lignitic seams; an understanding of the nature of the flora associated with the formation of the coals; an understanding of any correlations which may exist between the elements present in the seams; and an understanding of the chemical and physical environment in which the lignites were formed. The efforts have yielded data which suggest that future efforts will be most effective if work is restricted to four areas of research. A program of chemical, petrographic, and spectrochemical analyses, of autoradiographic studies, of research centered upon the chemical and physical characteristics of swamp environments, and of palynological research is included. (auth)

4039 AEC-tr-2435((Pt. 2) (p. 187–206))
LEAD ISOTOPES AND THEIR GEOLOGICAL SIGNIFICANCE. A. P. Vinogradov. p. 187–206 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 20p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7776.

4040 AEC-tr-2435((Pt. 3) (p. 129–44))
APPLICATION OF RADIOACTIVE METHODS IN PROSPECTING. V. N. Dakhnov. p. 129–44 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7777.

4041 AEC-tr-2435(Pt. 3) (p. 145–52))
USING RADIOMETRY IN PROSPECTING. F. A. Alexeyev [Alekseev], A. P. Grumbkov, and Y. [also Yu.] E. Kirshfeldt. p. 145–52 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7778.

4042 AEC-tr-2435((Pt. 3) (p. 153–62))
DIFFERENTIATION OF OIL-BEARING AND WATER-BEARING BEDS BY RADIOACTIVE METHODS IN CASED WELLS. A. I. Kholin. p. 153–62 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7779.

4043 AEC-tr-2435((Pt. 3) (p. 163–72))
THE FEASIBILITY OF USING THE ACTIVATED SODIUM METHOD OF LOCATING OIL-BEARING AND WATER-BEARING STRATA AND OF DETERMINING WATER-OIL CONTACTS IN CASED WELLS. N. K. Kukharenkov, V. P. Odinokiv, and Yu. S. Shimelevich. p. 163–72 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7780.

4044 AEC-tr-2435((Pt. 3) (p. 173–82))
OUTLOOK FOR THE UTILIZATION OF RADIOACTIVE RADIATIONS IN OIL PROSPECTING AND OIL-FIELD DEVELOPMENT. G. H. Flerov and F. A. Alekseev. p. 173–82 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7781.

Refer also to abstract 4069.

METALS AND METALLURGY

4045 AECU-3191
Illinois Inst. of Tech. Armour Research Foundation, Chicago.
A STUDY OF THE MECHANISMS OF HEAT TREATMENT OF ZIRCONIUM-BASE ALLOYS. Status Report [for] July 1, 1955–February 29, 1956. R. F. Domagala and David W. Levinson. Mar. 15, 1956. 8p. Project No. B-068. Contract AT(11-1)-315. $1.80(ph OTS); $1.80(mf OTS).

The kinetics of transformation of zirconium binary alloys is being pursued. Mechanical property variation as a function of transformation is investigated. Zirconium–tin and zirconium–titanium alloys transform very rapidly when quenched from the beta field. These alloys have been demonstrated to be not amenable to heat treatment in the normal sense of the word. Eutectoid alloys, principally zirconium–molybdenum alloys, have shown a definite response to heat treatment in terms of mechanical property variation. An embrittling agent, probably "omega" phase, is suspect at this time for the brittleness observed in certain molybdenum alloys and the very high hardness levels reached in other alloys such as zirconium–niobium and zirconium–thorium. (auth)

4046 SEP-118
Sylvania Electric Products Inc. Atomic Energy Div., Bayside, N. Y.
CHEMICAL DIFFUSION RATES IN ALPHA AND BETA ZIRCONIUM–TIN SOLUTIONS. R. Resnick and R. Balluffi. Aug. 11, 1953. Decl. Nov. 3, 1955. 15p. Contract AT-30-1-GEN-366. (DCF-4122). $3.30(ph OTS); $2.40(mf OTS).

Chemical diffusivities in zirconium-rich alpha and beta zirconium–tin solutions have been obtained using sandwich type couples. The polycrystalline specimens were composed of pure crystal bar zirconium and an induction melted sponge zirconium–tin alloy and were diffused in pre-purified argon. In the temperature range 600 to 850°C the diffusivity for the alpha solutions is given approximately by the relation $D_{\text{alpha phase}} = 3.0 \times 10^{-6} e^{-22{,}000/RT}$. In the temperature range 1100 to 1300°C the relationship for the beta phase is $D_{\text{beta phase}} = 6.9 \times 10^{-4} e^{-36{,}600/RT}$. (auth)

4047 SEP-128
Sylvania Electric Products Inc. Atomic Energy Div., Bayside, N. Y.
THE HEAT CONTENT AND SPECIFIC HEAT OF ZIRCONIUM–TIN ALLOY. R. B. Holden and B. Kopelman. [1953]. Decl. Nov. 3, 1955. 18p. Contract AT-30-1-GEN-366. $3.30(ph OTS); $2.40(mf OTS).

Determinations with a drop calorimeter were made of

the heat content (25 to 1500°C) and the specific heat (100 to 900°C) of arc-melted 5% Sn–Zr alloy. For the range up to 900°C the heat content data are accurate to about one % and the specific heat to about three %. (auth)

4048 SO-2524
General Electric Co. Research Lab., Schenectady, N. Y. CREEP AND STRESS-RUPTURE PROPERTIES OF ZIRCONIUM EFFECT OF ANNEALING TREATMENT. R. W. Guard and J. H. Keeler. May 1956. 19p. Contract W-31-109-Eng-52. (56-RL-1541). $4.80(ph OTS); $2.70 (mf OTS).

The creep properties of arc-melted iodide zirconium have been investigated at temperatures up to 500°C. The results indicate that significant creep does not occur at stresses below the yield strength at temperatures below 300°C. The effect of different annealing treatments is significant only at 500°C where the creep-rupture stress of β-annealed material is significantly larger than that of α-annealed material. Metallographic examination of the specimens after creep shows that twinning is prominent only at 300°C and below, while polygonization and boundary deformation was quite important at 500°C, although it was more prominent in the α-annealed material. The superior creep resistance of the β-annealed material is related to its greater resistance to polygonization and its irregular boundary structure. (auth)

4049 WAPD-143
Westinghouse Electric Corp. Bettis Plant, Pittsburgh. MECHANICAL PROPERTIES EVALUATION OF ZIRCALOY-3. F. Forscher. Mar. 26, 1956. 47p. Contract AT-11-1-GEN-14. $0.35(OTS).

Strength, ductility, impact, and hardness properties of the three tentative Zircaloy-3 compositions are compared to Zircaloy-2 properties at several temperatures and heat treatment conditions. The strength properties of Zircaloy-2 are superior to any of the three alternate Zircaloy-3's. The ductility properties of the four alloys tested are not sufficiently different to favor one composition over another. Ingot size has no effect and melting practice has a minor effect on the mechanical properties of these alloys. (auth)

4050 AEC-tr-2435((Pt. 1) (p.251-4))
RESULTS OF THE INFLUENCE OF IRRADIATION ON THE DIFFUSION OF SILVER IN LITHIUM. V. K. Zavoisky [Zavoiskii] and B. V. Ershler. p.251-4 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 4p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7797.

4051 AEC-tr-2435((Pt. 2) (p. 207–14))
PHASE DIAGRAMS OF SOME PLUTONIUM SYSTEMS. S. T. Konobeevsky [Konobeevskii]. p. 207–14 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7796.

4052 AEC-tr-2435(Pt. 3) (p. 17–26))
INVESTIGATION OF MIXING PROCESSES IN OPEN-HEARTH FURNACE BATHS BY MEANS OF RADIOACTIVE ISOTOPES. E. S. [A. I.] Osipov, L. A. Schwarzman [Shvartsman], V. E. Yudin [Iudin], and M. L. Sazonov. p. 17–26 of CONFERENCE OF ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7799.

4053 AEC-tr-2435((Pt. 3) (p. 39–48))
INVESTIGATION OF NON-METALLIC INCLUSIONS BY RADIOGRAPHY. S. M. Gnuchev and V. G. Kuklev. p. 39–48 of CONFERENCE OF ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7800.

4054 AEC-tr-2435((Pt. 3) (p. 49–62))
AN ISOTOPE-EXCHANGE METHOD OF MEASURING THE EVAPORATION RATE AND THE DIFFUSION COEFFICIENT OF METALS. A. [also An.] N. Nesmayanov, N. F. Lebedev, V. N. [also V. I.] Lozgachev, and E. G. Chudinov. p. 49–62 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7801.

4055 AEC-tr-2435((Pt. 3) (p. 63–70))
METHODS OF STUDYING DIFFUSIONS WITH RADIOACTIVE ISOTOPES. A. A. Zhukhovitsky [Zhukhovitskii]. p. 63–70 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 80p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7802.

4056 AEC-tr-2435(Pt. 3) (p. 85–96))
USE OF RADIOACTIVE ISOTOPE IN INVESTIGATING CUTTING-TOOL WEAR. E. P. Nadeinskaya. p. 85–96 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7803.

4057 AEC-tr-2435((Pt. 3) (p. 97–104))
IONIZATION METHODS FOR DETECTING DEFECTS IN THICK SECTIONS OF METALS BY γ-RAYS. I. G. Fadikov and A. A. Samokhvalov. p. 97–104 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7804.

4058 AEC-tr-2435((Pt. 3) (p. 105–14))
MEASURING THICKNESS AND DENSITY BY MEANS OF RADIOACTIVE ISOTOPES. A. M. Bogachev, B. I. Verkhovsky [Verkhovskii], and A. N. Makarov. p. 105–14 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7805.

4059 AEC-tr-2435((Pt. 3) (p. 115–18))
AN EXPERIMENT IN THE USE OF ISOTOPES FOR BRANDING ROLLED STEEL. V. A. Yanushkovsky [Yanushkovskii]. p. 115–18 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 4p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7806.

4060 AEC-tr-2474
ON THE INFLUENCE OF PRESSURE ON THE INTERDIFFUSION OF METALS IN CONNECTION WITH THE EFFECT OF PORE FORMATION. Ya. E. (Ye.) Geguzin. Translated by S. Rothman from Doklady Akad. Nauk S.S.S.R. 106, 839-40(1956). 4p.

A diffusion experiment with specimens under pressures greater than 10 kg/cm^2, making volume changes difficult, lead to the disappearance of diffusional porosity and to the decrease of the larger partial diffusion coefficient. With pressures over 12 kg/cm^2 there was a smaller change in the diffusion coefficient showing that after the elimination of diffusional porosity, the effect of pressure is determined by processes different from those that lead to the elimination of the diffusional porosity. (F.S.)

PHYSICS

4061 AEC-tr-2435(Pt. 1)
CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 263p.

With Introductory Remarks by A. N. Nesmeyanov.

The 22 papers of this compilation were abstracted from the Russian and appear in Nuclear Science Abstracts Vol. 9 as abstract numbers 7797, 7862, 7863, 7888, 7890, 7891, 7892, 7905, 7906, 7907, 7908, 7924, 7925, 7926, 7927, 7928, 7929, 7930, 7932, 7933, 7934, and 7952. (L.M.T.)

INSTRUMENTS

4062 DP-150
Du Pont de Nemours (E. I.) & Co. Savannah River Lab., Augusta, Ga.
AN EXPLOSION-RESISTANT ION CHAMBER FOR THE MEASUREMENT OF TRITIUM. Fred D. Ryder. Mar. 1956. 12p. Contract AT(07-2)-1. $0.15(OTS).

An ion chamber was constructed to monitor gaseous tritium in hydrogen–oxygen mixtures that have a high relative humidity and that might fall within the explosive limits. In calibration tests the ion chamber responded linearly to tritiated water vapor in air, at concentrations from 10^{-5} to 10^{-4} microcurie per cubic centimeter. The chamber withstood deliberate internal explosions without detectable damage. (auth)

ISOTOPES

4063 ORNL-2064
Oak Ridge National Lab., Tenn.
RADIOISOTOPE PRODUCTION AND PROCESS DEVELOPMENT. Annual Report for 1955. A. F. Rupp. (Compiled from Data by E. E. Beauchamp, J. H. Gillett, and E. J. Witkowski). May 3, 1956. 22p. Contract W-7405-eng-26. $3.30(ph OTS); $2.40(mf OTS).

Production and process development activities during the calendar year 1955 are summarized. Twelve thousand seven hundred and fortv-nine shipments were made. The quantity of activity shipped increased from 28,879 c in 1954 to 49,383 c in 1955. The increase resulted from a trend to larger quantities per package and increases in shipments of Co^{60} and Cs^{137} for large irradiation units. Major developments during the period included: improved techniques for handling, assaying, and fabricating sources of over 10,000 c of Co^{60} per batch; separation of Am^{241} from Pm^{147} by ion exchange methods; design of new, more efficient isotope shipping containers; separation of Xe^{131m} from I^{131}; fabrication of a shielded transfer tank for the transportation of 5000-c batches of high-level radioactive waste from the ICPP; semi-works testing of flowsheets to be used in the Fission-Product Pilot Plant; and completion of design phases of the Fission-Product Pilot Plant. (For preceding period see ORNL-1861.) (C.H.)

MEASURING INSTRUMENTS AND TECHNIQUES

4064 BMI-1083
Battelle Memorial Inst., Columbus, Ohio.
THE DEVELOPMENT OF A THERMAL-NEUTRON-FLUX MEASURING INSTRUMENT. Charles K. Smith, C. Vernon Weaver, Joel W. Chastain, and Sherwood L. Fawcett. Apr. 12, 1956. 17p. Contract W-7405-eng-92. $0.20 (OTS).

An instrument was developed to measure thermal neutron flux directly and automatically in the range from 10^{13} to 10^{14} neutrons/(cm^2)(sec) at ambient temperatures up to 600°F. Two prototype tests were conducted. Measurements made with this instrument are independent of gamma flux and, within a small error, independent of ambient temperature. The method depends on balancing the temperatures of an electrically heated balancing element and a fission-heated uranium-fueled sensing element. Thus, the instrument gives a direct measurement of fission-product power, produced by a known amount of uranium. The flux-detector assembly measures $^3/_{16}$-in. in OD by about 4 in. in length and is fitted with an extension so that it is movable over a 20-ft length inside a 0.210-in. ID tubular well in the reactor. Two tests of the prototype instrument were conducted by making vertical traverses of the flux field in the beryllium reflector of the MTR. Measurements were made in 1-in. increments from 16 in. above to 5 in. below the center line of the core. Instrument response time was about 1 min for each measurement. The maximum deviation of a single instrument reading from the average readings at a given point was about 2.5% at a flux of 10^{14} neutrons/(cm^2)(sec). (auth)

4065 BMI-1086
Battelle Memorial Inst., Columbus, Ohio.
A WIRE-ACTIVATION TECHNIQUE FOR REACTOR-FLUX-PROFILE MEASUREMENTS. Alton E. Klickman, George W. Cunningham, Joel W. Chastain, Donald L. Keller, and Sherwood L. Fawcett. Apr. 25, 1956. 18p. Contract W-7405-eng-92. $0.25(OTS).

The application of the wire-activation technique was extended so that flux profiles could be obtained in a reactor core where the flux is of the order of 10^{14} neutrons/(cm^2)(sec) and the ambient temperature is about 600 F. A Mg–0.01 at. % In wire 0.010 in. in diameter was investi-

gated. The wire is irradiated first in a 0.170-in.-OD by 0.110-in.-ID Mg tube and then in a Mg–33 at. % Cd tube of the same size. Thus, it is possible to obtain both the thermal and slowing-down flux profiles quite rapidly. To prove the feasibility of the method, in-pile tests were conducted at CP-5. Ten 10-in. wires were irradiated in magnesium tubes and ten 10-in. wires in Mg–33 at. % Cd tubes. The irradiation time was 30 min. After a 1-hr. period to allow the decay of extraneous activities, the wire was run past a collimated scintillation counter. The counter sees 1-in. sections of the wire which it counts for 15 sec each. A mechanism records the counts and then moves the wire 1 in. for the next counting period. Tests with the Mg–0.01 at. % In wire showed that the method was feasible and the counting rates were high enough to give reliable results. Some specimens of Co and Mg–0.1 at. % Mn were also exposed in the CP-5. It was hoped that materials with different resonance absorption peaks could be used to give an energy spectrum. However, the Co wire proved unsatisfactory because of impurities and the Mg–0.1 at. % Mn gave counting rates which were too low. (auth)

4066 UCRL-4666
California. Univ., Livermore. Radiation Lab.
TEMPERATURE COEFFICIENTS OF SCINTILLATING SYSTEMS. William P. Ball, Rex Booth, and Malcolm MacGregor. Mar. 16, 1956. 10p. Contract W-7405-eng-48. $0.15(OTS).

Temperature coefficients of photomultiplier tubes and NaI (Tl), anthracene, stilbene, and plastic scintillators were measured over the range 5°C to 40°C. The coefficients, which are negative, vary from about −0.1% change in pulse height per °C for NaI (Tl), to −0.5%/°C for anthracene, and the coefficients themselves are functions of the temperature. (auth)

4067 AEC-tr-2435((Pt. 1) (p.209-16))
A BENT-CRYSTAL NEUTRON SPECTROMETER WITH A QUARTZ SINGLE-CRYSTAL. Yu. G. Abov. p.209-16 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7862.

4068 AEC-tr-2435((Pt. 1) (p.239-50))
DOSIMETRY OF IONIZING RADIATION WITH THE AID OF INFRARED SENSITIVE PHOSPHORS. V. V. Antonov-Romanovsky [Romanovskii], I. B. Keirim-Marcus, M. S. Poroshina, and Z. A. Trapeznikova. p.239-50 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7863.

4069 AEC-tr-2435((Pt. 3) (p. 183–93))
USE OF A SCINTILLATION COUNTER FOR RADIOMETRIC APPARATUS IN THE OIL INDUSTRY. V. [also B.] G. Erozolimsky [Erozolimskii] and D. F. Bespalov. p. 183–93 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF TECHNICAL SCIENCE. (Translation). 11p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7861.

MESONS

4070 AEC-tr-2417
MASS DIFFERENCE OF ELEMENTARY PARTICLES. A. Brodskiĭ, D. Ivanenko, and N. Korst. Translated by Rose V. Germain from Doklady Akad. Nauk S.S.S.R. 105, 1192-5 (1955). 4p.

Schwinger's method of minimum self-time approximation is used in investigation of mass difference of neutral and charged particles. Calculations are based on zero spin of charged particles (π mesons) and the mass operator of Dirac particles with anomalous magnetic moments (nucleons) interacting with the field of virtual photons. (R.V.J.)

NEUTRONS

4071 APEX-248
General Electric Co. Aircraft Nuclear Propulsion Dept., Cincinnati.
ANALYTICAL SOLUTION OF THE P_3 APPROXIMATION TO TRANSPORT THEORY IN TWO CYLINDRICAL REGIONS. (Program I). Robert R. McCready. Mar. 30, 1956. 18p. Contracts AF33(038)-21102 and AT(11-1)-171. $0.20(OTS).

Program I solves the P_3 approximations to transport theory in two cylindrical regions with a uniform source in either or both zones. A short output giving disadvantage factors, average fluxes, total fluxes, and radial neutron currents is available. A long output listing the above information and the higher moments and angular distribution of the flux can also be called for. (auth)

4072 MLM-1054
Mound Lab., Miamisburg, Ohio.
THE SPECTRUM OF POLONIUM–BERYLLIUM NEUTRON SOURCES. R. J. Breen, M. R. Hertz, and D. U. Wright, Jr. June 13, 1955. 51p. Contract AT-33-1-GEN-53. $0.35(OTS).

A proton-recoil neutron spectrometer, usable in the range of 1.3 to 11 Mev, was used for the investigation of the neutron radiation from Po–Be neutron sources. The spectra of two standard sources were congruous within the resolution of the instrument. Average energy of the neutrons from these sources was 4.5 Mev. The spectra contained two major groups: the larger, with a relative intensity of 7 and energy peak of 3.2 Mev, resulted from leaving the residual C^{12} nucleus in the 4.45 Mev energy level; and the smaller, with a relative intensity of 3 and energy peak of 6.4 Mev, resulted from leaving the C^{12} nucleus in the ground state. A hypothetical spectrum constructed from thick target excitation curves, using the 7:3 ratio, was in agreement with the experimental results. (auth)

4073 AEC-tr-2435((Pt. 1)(p.29-38))
MULTIPLICATION OF NEUTRONS IN URANIUM–GRAPHITE SYSTEMS. L. V. Groshev, E. L. Feinberg, and I. M. Frank. p.29-38 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7888.

4074 AEC-tr-2435((Pt. 1)(p.69-80))
RESONANCE ABSORPTION OF NEUTRONS IN HETEROGENEOUS SYSTEMS. N. A. Burgov. p.69-80 of CON-

FERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7890.

4075 AEC-tr-2435((Pt. 1) (p.81-94))
DEPENDENCE OF THE EFFECTIVE NUMBER OF SECONDARY NEUTRONS ON THE ENERGY OF CAPTURED NEUTRONS. PART I. S. Ya. Nikitin, S. I. Sukhoruchkin, K. G. Ignatyev [Ignat'ev], and N. D. Galanina. PART II. S. Ya. Nikitin, P. A. Krupchitsky [Krupchitskii], and V. F. Belkin. p.81-94 of CONFERENCE OF THE ACADEMY OF SCIENCES ON THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7891.

4076 AEC-tr-2435((Pt. 1) (p.95-108))
AVERAGE NEUTRON VELOCITIES IN VARIOUS MEDIA. K. D. Tolstov, F. L. Shapiro, and I. V. Shtranikh. p.95-108 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7892.

NUCLEAR PROPERTIES

4077 AEC-tr-2435((Pt. 1) (p.167-82))
α-SPECTRA OF HEAVY ELEMENTS. L. L. Goldin, G. I. Novikova, and E. F. Tretyakov. p.167-82 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 16p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7905.

4078 AEC-tr-2435((Pt. 1) (p.183-94))
ENERGY LEVELS OF THE U^{237} NUCLEUS AND THE DECAY OF Am^{242m}. S. A. Baranov and K. N. Shlyagin. p.183-94 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7906.

4079 AEC-tr-2435((Pt. 1) (p.195-208))
NEUTRON-CAPTURE γ-RAY SPECTRA OF SOME HEAVY NUCLEI. B. P. Adyasevich, B. D. Groshev, and A. M. Demidov. p.195-208 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7907.

NUCLEAR REACTORS

4080 AECD-3731
Alco Products, Inc., Schenectady, N. Y.
ARMY PACKAGE POWER REACTOR. Description and Supplement. Oct. 14, 1955. Decl. with deletions Nov. 10, 1955. 128p. $0.65(OTS).

The APPR-1 is described and the various hazards are reviewed. Because of the reactor's location near the nation's Capitol, containment is of the utmost importance. The maximum energy release in any possible accident is 7.4 million BTU's which is completely contained within a $\frac{1}{8}$ inch thick steel cylindrical shell with hemispherical ends. The vapor container is 60 feet high and 32 feet in diameter and is lined on the inside with 2 feet of reinforced concrete which provides missile protection and is part of the secondary shield. All possible nuclear excursions are reviewed and the energy from any of these is insignificant compared to the stored energy in the water. The maximum credible accident is caused by the reactor running constantly at its maximum power of 10 Mw and through an extremely unlikely sequence of failures, causing the temperature of the water in the primary and secondary systems to rise to saturation; whereupon a rupture occurs releasing the stored energy of 7.4 million BTU's into the vapor container. If the reactor core melts during the incident, a maximum of 10^8 curies of activity is released. While it appears impossible for a rupture of the vapor container to occur except by sabotage or bombing, the hazards to the surrounding area are discussed in the event of such a rupture occurring simultaneously with the maximum credible accident. (auth)

4081 BMI-1085
Battelle Memorial Inst., Columbus, Ohio.
AN ANALYSIS OF TRANSIENTS IN A PRESSURIZED-WATER REACTOR DURING CONTINUOUS ROD WITHDRAWAL. Robert F. Redmond, Joseph J. Stone, and Joel W. Chastain, Jr. Apr. 25, 1956. 14p. Contract W-7405-eng-92. $0.20(OTS).

Two start-up type accidents in a pressurized water reactor have been considered and approximate solutions obtained for each one. In both accidents, continuous withdrawal of the control rods is the method for reactivity addition. The scram mechanisms are assumed inoperative. In the first of these accidents, the reactor is operating at design power and temperature. Reactor-simulator studies indicate that the first power pulse is stopped by void formation, and thereafter the reactor power oscillates around an equilibrium power level that increases linearly. The second accident is postulated to occur at room temperature but at operating pressure. This problem was solved numerically and showed that the first power transient is halted before any damage results to the reactor. Thus, the reactor would continue to run. The analysis was not continued past the first pulse. (auth)

4082 BNL-2094
Brookhaven National Lab., Upton, N. Y.
EXPONENTIAL EXPERIMENTS ON LIGHT WATER MODERATED 1 PER CENT U-235 LATTICES. H. J. Kouts, J. Chernick, and I. Kaplan. Nov. 28, 1952. Decl. Oct. 31, 1955. 64p. Contract AT-30-2-Gen-16. $0.40 (OTS).

Measurements were carried out in a water tank placed on a thermal column which occupies a portion of the top of

the Brookhaven shield. Data are included on relaxation lengths, neutron flux measurements, migration areas, and intracell flux traverses. (B.J.H.)

4083 CF-56-1-86
Oak Ridge National Lab., Tenn.
HOMOGENEOUS REACTORS. Process Design Section Progress Report for December 1955. R. B. Korsmeyer. Jan. 12, 1956. 9p. Contract [W-7405-eng-26]. $1.80 (ph OTS); $1.80(mf OTS).

Status of the HRT design for steam and gas pressurization, sampler, thermal shield and the pressure vessel is reported. (F.S.)

4084 IDO-16284
Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho.
HISTORY AND OPERATING PRACTICES OF THE MTR REACTOR SAFEGUARD COMMITTEE. D. R. deBoisblanc. [Apr. 20, 1956]. 12p. Contract AT(10-1)-205. $0.15(OTS).

4085 IDO-16285
Phillips Petroleum Co. Atomic Energy Div., Idaho Falls, Idaho.
EXPERIMENTAL INVESTIGATIONS OF REACTOR TRANSIENTS. W. E. Nyer, S. G. Forbes, F. L. Bentzen, G. O. Bright, F. Schroeder, and T. R. Wilson. Apr. 20, 1956. 25p. Contract AT(10-1)-205. $0.25(OTS).

The test program for the study of enriched-fuel, water-moderated reactor systems is surveyed. Complete descriptions are given of the SPERT-I reactor, a non-pressurized, H_2O-moderated and -reflected reactor using fully enriched fuel in modified MTR-type elements. The nuclear characteristics of SPERT-I have also been studied, and data are included on integral shim rod worth, reactivity losses, and temperature coefficients. Results of transient tests on SPERT-I are also included. (B.J.H.)

4086 NAA-SR-1127
North American Aviation, Inc., Downey, Calif.
SOME COMMENTS ON THE EFFECTS OF EPITHERMAL NEUTRONS IN A REACTOR. E. Richard Cohen. Feb. 15, 1955. Decl. Nov. 16, 1955. 43p. Contract AT-11-1-GEN-8. $0.30(OTS).

Neutrons in an absorbing and moderating medium at temperature T_0 collide with a moving, rather than a stationary, moderator which can transfer energy back to the neutrons and hence reduce the rate of energy loss. Furthermore, absorption will remove neutrons significantly at energies greater than "thermal." An approximate neutron distribution can be constructed, using a Maxwellian plus a slowing down tail, which represents these effects. From this distribution, an effective age which gives the correct absorption rate when used in the naive theory can be derived. For this effective age the lower limit, E, of the usual Fermi integral is much larger than kT_0. The value of E/kT_0 depends upon the ratio $\sigma_0/\xi\sigma_s(\sigma_0$ = absorption cross section at energy kT_0, $\xi\sigma_s$ = moderator slowing down power) and is of the order of 14 to 18. Thus, the correction from In to "thermal" for neutrons in D_2O is 6 cm^2 rather than 20 cm^2 usually used. (auth)

4087 NAA-SR-1618
Atomics International Div., North American Aviation, Inc., Canoga Park, Calif.
THE KINETIC BEHAVIOR OF WATER BOILER TYPE REACTORS. Marlin E. Remley, John W. Flora, David L. Hetrick, and Leo P. Inglis. Apr. 1, 1956. 32p. Contract AT-11-1-GEN-8. $0.25(OTS).

A program for the evaluation of the safety of homogeneous reactor designs with regard to accidental release of large quantities of reactivity is outlined. A comprehensive investigation of all the parameters which affect the severity and magnitude of accidental power excursions is to be made. Complete descriptions are given of the KEWB experimental facility to be used for these experiments, including the buildings, waste disposal facilities, reactors, fuel handling systems, and instrumentation. Theoretical studies of the transient behavior of water boiler reactors have been made. Results of analog computations of the reactivity changes are included. (B.J.H.)

4088 NAA-SR-Memo-1631
North American Aviation, Inc., [Downey,] Calif.
THE APPLICATION OF CAMPBELL'S THEOREM ON SHOT EFFECT TO THE CALCULATION OF THE PROPERTIES OF EFFERVESCENE NOISE IN A WATER BOILER NUCLEAR REACTOR. J. S. Bower. May 22, 1953. 3p. $1.80(ph OTS); $1.80(mf OTS).

4089 WAPD-CTA-IH-87
Westinghouse Electric Corp. Atomic Power Div., Pittsburgh.
PWR PREOPERATIONAL RADIATION MONITORING PROGRAM. Preliminary Report. Mar. 21, 1956. 7p. $1.80(ph OTS); $1.80(mf OTS).

The proposed radiation monitoring program to be used with the PWR is briefly outlined. (B.J.H.)

4090 AEC-tr-2435((Pt. 1)(p.1-14))
WORK OF THE USSR ACADEMY OF SCIENCES ON URANIUM–GRAPHITE REACTORS. V. S. Fursov. p.1-14 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7924.

4091 AEC-tr-2435((Pt. 1)(p.39-58))
INVESTIGATION OF THE PARAMETERS OF HETEROGENEOUS URANIUM–GRAPHITE SYSTEMS BY THE PRISM METHOD. L. V. Groshev, O. I. Kozinets, L. E. Lazareva, K. D. Tolstov, E. L. Feinberg, I. M. Frank, F. L. Shapiro, and I. V. Shtranikh. p.39-58 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 20p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7925.

4092 AEC-tr-2435((Pt. 1) (p.109-22))
MEASUREMENT OF TEMPERATURE EFFECTS IN URANIUM–V. [also B.] P. Adyasevich, I. M. Frank, O. I. Kozinets, F. L. Shapiro, I. V. Shtranikh, and K. D. Tolstov. p.109-22 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7926.

4093 AEC-tr-2435((Pt. 1) (p.133-40))
WORK ON U^{235} AND Pu^{239} REACTORS WITH HYDROGEN MODERATORS CONDUCTED AT THE ACADEMY OF SCIENCES OF THE USSR. G. N. Flerov. p.133-40 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 8p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7927.

4094 AEC-tr-2435((Pt. 1) (p.141-60))
SOME PROBLEMS IN THE THEORY OF THE URANIUM-WATER LATTICE. S. M. Feinberg. p.141-60 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 20p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7928.

4095 AEC-tr-2435((Pt. 1) (p.161-6))
METHOD OF MEASUREMENT OF THE FAST-NEUTRON MULTIPLICATION FACTOR IN URANIUM-WATER LATTICES. G. A. Stolyarov, L. V. Komissarov, V. P. Katkov, and Yu. V. Nikolsky [Nikol'skii]. p.161-6 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 6p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7929.

4096 AEC-tr-2435((Pt. 1) (p.257-9))
APPROXIMATION METHODS IN NUCLEAR REACTOR CALCULATIONS. G. I. Marchuk. p.257-9 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 3p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7930.

Refer also to abstract 4065.

NUCLEAR TRANSFORMATION

4097 NYO-7588
Rochester, N. Y. Univ.
DEUTERON REACTIONS AND THE A=14 POLYAD. J. B. French. Mar. 15, 1956. 8p. Contract AT(30-1)-875. $1.80(ph OTS); $1.80(mf OTS).

The information which may be derived by deuteron stripping and pick-up reactions involving the nuclei A = 14,15 is discussed in general terms. In particular, the reactions $N^{14}(d,p)N^{15}$, $N^{14}(d,n)O^{15}$, and $C^{14}(d,n)N^{15}$ are discussed. (B.J.H.)

4098 AEC-tr-2435((Pt. 1) (p.123-32))
MEASUREMENTS OF THE AVERAGE NUMBER OF NEUTRONS EMITTED IN THE FISSION OF SOME URANIUM AND PLUTONIUM ISOTOPES. PARTS I, II, AND III. V. I. Kalashnikova, A. V. Krasnushkin, V. I. Lebedev, L. A. Mikaelyan, M. I. Pevzner, P. E. Spivak, and V. P. Zakharova. p.123-32 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7932.

4099 AEC-tr-2435((Pt. 1) (p.217-26))
NEUTRON YIELD IN THE PHOTODISINTEGRATION OF URANIUM AND THORIUM. L. E. Lazareva, B. I. Gavrilov, B. N. Valuev, G. N. Zatsepina, and V. S. Stavinsky [Stavinskii]. p.217-26 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7933.

4100 AEC-tr-2435((Pt. 1) (p. 255-6))
RESULTS OF MEASUREMENTS OF THE EFFECTIVE NUMBER OF SECONDARY NEUTRONS FROM U^{233}, U^{235}, AND Pu^{239} FOR PRIMARY NEUTRONS IN THE ENERGY RANGE FROM 0.2 TO 100 ev. B. G. Erozolimsky [Erozolimskii]. p.255-6 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 2p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7934.

4101 AEC-2435((Pt. 2) (p. 1-12))
RADIOCHEMICAL RESEARCH ON NUCLEAR-TRANSFORMATION PRODUCTS RESULTING FROM BOMBARDMENT WITH HIGH-ENERGY PARTICLES. A. P. Vinogradov. p. 1-12 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7941.

4102 AEC-tr-2435((Pt. 2) (p. 55-64))
NUCLEAR FISSION REACTIONS DUE TO NEGATIVE PIONS AND FAST PROTONS. N. A. Perfilov, N. S. Ivanova, O. V. Lozhkin, V. I. Ostroumov, and V. P. Shamov. p. 55-64 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7935.

4103 AEC-tr-2435((Pt. 2) (p. 65-78))
RADIOCHEMICAL INVESTIGATION OF THE FISSION OF BISMUTH, THORIUM AND URANIUM WITH 480 MEV PROTONS. A. P. Vinogradov, I. P. Alimarin, V. I. Baranov, A. K. Lavrukhina, T. V. Baranova, F. I. Pavlotskaya, A. A. Bragina, and Yu. V. Yakovlev. p. 65-78 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7936.

4104 AEC-tr-2435((Pt. 2) (p. 79-84))
RADIOCHEMICAL INVESTIGATION OF THE FISSION OF

TUNGSTEN WITH 280-MEV DEUTERONS. B. V. Kurchatov, V. N. Mekhedov, M. Ya. Kuznetsova, and L. N. Kurchatova. p. 79–84 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 6p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7937.

4105 AEC-tr-2435((Pt. 2) (p. 85–100))
RADIOCHEMICAL INVESTIGATION OF THE SPALLATION OF COPPER AND BISMUTH NUCLEI WITH HIGH-ENERGY PARTICLES. A. P. Vinogradov, I. P. Alimarin, V. I. Baranov, A. K. Lavrukhina, T. V. Baranova, and F. I. Pavlotskaya. p. 85–100 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 16p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7938.

4106 AEC-tr-2435((Pt. 2) (p. 101–10))
SPALLATION AND FISSION REACTIONS OF COMPLEX NUCLEI(Cu, La, Bi). A. N. Murin, B. K. Preobrazhensky [Preobrazhenskii], I. A. Yutlandov, and M. A. Yakimov. p. 101–10 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 10p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7939.

4107 AEC-tr-2435((Pt. 2) (p. 111–24))
RADIOCHEMICAL INVESTIGATION OF THE PRODUCTS OF THE SPALLATION OF SILVER WITH HIGH-ENERGY PARTICLES. B. V. Kurchatov, V. N. Mekhedov, N. I. Borisova, M. Ya. Kuznetsova, L. N. Kurchatova, and L. V. Christyakov. p. 111–24 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1–5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7940.

PARTICLE ACCELERATORS

4108 NYO-7592
Rochester, N. Y. Univ.
A STUDY OF THE NEUTRON HAZARD AT THE 130" SYNCHROCYCLOTRON (thesis). William F. Coombs, Jr. Apr. 18, 1956. 56p. Contract AT(30-1)-875. $9.30(ph OTS); $3.60(mf OTS).

A description of neutron measurements starting in 1952 and continuing to date is given. As a result a survey procedure for safe cyclotron operation was evolved and neutron survey equipment was designed and constructed. A shield was designed and is evaluated. (F.S.)

4109 UCRL-3057
California. Univ., Berkeley. Radiation Lab. and California. Univ., Livermore. Radiation Lab.
HIGH-CURRENT LINEAR ACCELERATORS. A. F. Clark, R. C. Jopson, W. A. S. Lamb, Lloyd Smith, and C. M. Van Atta. June 27, 1955. 5p. Contract W-7405-eng-48. $1.80(ph OTS); $1.80(mf OTS).

Design parameters for the A-48 accelerator are tabulated. Designed for high-efficiency proton, deuteron, and alpha acceleration, the A-48 is expected to produce unavailable radioactive isotopes which have small activation cross sections. The magnet and drift tube characteristics and arrangement and expected beam intensity are discussed. (D.E.B.)

4110 UCRL-3366
California. Univ., Berkeley. Radiation Lab.
USE OF THE WIRE LOOP IN LOCATING THE ORBITAL SURFACE OF A CYCLOTRON FIELD. Glen R. Lambertson. Mar. 21, 1956. 9p. Contract W-7405-eng-48. $0.[illegible] (OTS).

The orbital surface of a cyclotron magnetic field is defined and the similarity between particle orbit and a current-carrying flexible wire is noted. In a vertical cyclotron field, an equation for the vertical location of a wire loop is found. When the point of support is on the orbital surface, the force required to support the loop is shown to be independent of current. Application of the loop to location of the orbital surface is discussed. Factors involved in selection of a suitable wire material and wire size are considered. (auth)

4111 AEC-tr-2435((Pt. 1)(p.15-28))
HIGH-ENERGY ACCELERATORS IN RESEARCH ON NUCLEAR PROCESSES. M. G. Mescheryakov. [Meshcheryakov.] p.15-28 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 14p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7908.

RADIATION ABSORPTION AND SCATTERING

4112 AEC-tr-2435((Pt. 1)(p.59-68))
MEASURING THE RESONANCE ABSORPTION OF NEUTRONS IN A URANIUM–GRAPHITE LATTICE. V. B. Egiazarov, V. S. Dikarev, and V. G. Madeev. p.59-68 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 10p.

Procedures and results are presented from experiments in which resonance absorption was measured directly in cylindrical U slugs and tubes of various diameters. (L.M.T.)

RADIATION EFFECTS

4113 AEC-tr-2435((Pt. 1) (p.227-38))
CHANGE IN THE PROPERTIES OF GRAPHITE WHEN IRRADIATED BY NEUTRONS. V. I. Klimenkov and Yu. N. Aleksenko. p.227-30 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES. (Translation). 12p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7952.

Refer also to abstract 4028.

SHIELDING

4114 CF-56-1-106
Oak Ridge National Lab., Tenn.
SHIELDING FOR THE HRT CHARCOAL PIT AND OFF-GAS LINE. James O. Kolb. Jan. 20, 1956. 13p. Contract [W-7405-eng-26]. $3.30(ph OTS); $2.40(mf OTS).

Calculations for corrections for shielding of the HRT charcoal pit, off-gas line from the east valve pit to the charcoal pit and dose rates for various dirt and concrete thicknesses are given. (F.S.)

4115 HKF-1 and Suppl.
Ferguson (H. K.) Co., Inc., New York.
HIGH DENSITY CONCRETE SHIELDING. Feb. 15, 1949. Supplement title: HEAT TESTING OF HIGH-DENSITY CONCRETE. June 1, 1949. Decl. Sept. 29, 1955. 42p. C. R. Binner, C. B. Wilkie, and Philip Miller. For Brookhaven National Lab. Contract AT-30-2-Gen-16, A-E-M-S-26.

The supplement to this report was declassified with deletions Nov. 7, 1950 and issued as AECD-3001. $0.35 (OTS).

Descriptions are given of the development, design, and construction of the shield for the Brookhaven Reactor. Included in appendices are specifications for the preparation of the heavy concrete, the limonite aggregate, and the iron or steel aggregate; specifications for the placing of the mortar; and specifications for the welding enclosures. Data are also given on the heat testing of high-density concrete. (B.J.H.)

SPECTROSCOPY

4116 AEC-tr-2466
SPECTRUM AND ENERGY LEVELS OF THE POLONIUM ATOM. E. A. Vernyj, A. N. Zajdel', and K. G. Shvebelblit. Translated from Doklady Akad. Nauk S.S.S.R. 104, 710-12 (1955). 8p.

An abstract of this paper appears in Nuclear Science Abstracts as NSA 10-1618. (L.M.T.)

TRITIUM AND TRITIUM COMPOUNDS

Refer to abstract 4062.

URANIUM AND URANIUM COMPOUNDS

4117 AEC-tr-2435((Pt. 2) (p. 125-8))
YIELDS OF VARIOUS NEODYMIUM AND CERIUM ISOTOPES IN THE FISSION OF U^{233}. G. M. Kukavadze, M. P. Anikina, L. L. Goldin, and B. V. Ershler. p. 125-8 of CONFERENCE OF THE ACADEMY OF SCIENCES OF THE USSR ON THE PEACEFUL USES OF ATOMIC ENERGY, JULY 1-5, 1955. SESSION OF THE DIVISION OF CHEMICAL SCIENCE (Translation). 4p.

This paper was originally abstracted from the Russian and appeared in Nuclear Science Abstracts as NSA 9-7982.